

SPACE OPERATIONS SYMPOSIUM (B6)  
Training Relevant for Operations, including Human Spaceflight (3)

Author: Dr. Peter Eichler  
EADS Astrium Space Transportation GmbH, Germany, peter.eichler@airbus.com

Dr. Anette Bade  
Astrium Space Transportation, Germany, anette.bade@airbus.com  
Dr. Rüdiger Seine  
European Space Agency (ESA), Germany, ruediger.seine@esa.int  
Mrs. Kirsten Bischoff  
Astrium Space Transportation, Germany, kirsten.bischoff@esa.int

EVOLUTION OF THE ESA ASTRONAUT TRAINING FOR COLUMBUS SYSTEMS OPERATIONS

**Abstract**

Proper training of the astronauts is an essential part of increment preparation and execution to ensure the safe and effective operation of the International Space Station ISS. Like each of the International Partners, ESA is responsible for the basic training of its own astronauts and the training of all ISS crew members on its own contributions to the ISS program, i.e. training of the crew operations of Columbus Systems, ESA P/Ls and ATV. The ESA crew training is mainly implemented at the European Astronaut Centre EAC in Cologne, Germany with some multi-segment training performed at the NASA Johnson Space Centre in Houston, USA. The training is developed and implemented by a team of about 20 crew instructors under the responsibility of the Industrial Operational Team (IOT) lead by EADS Astrium Space Transportation GmbH.

The ISS Systems training is organized in general by crew roles and responsibilities in User, Operator and Specialist Level training. Furthermore the entire training catalogue is constantly harmonized and coordinated on an International Partner level, e.g. within the Core Systems Crew Training Working Group (CSCTWG).

Development of the ESA Training for ISS began in 1999 with a first implementation in 2002. After two years of Columbus on-orbit operations and the first successful ATV launch, several crews that were trained by ESA returned from their ISS mission and provided valuable feedback on the structure, content and effectiveness of the training based on their orbital experience. In addition, improvements in the operational concepts and crew procedures were achieved by operational experience. Based on these inputs, an evolution effort is under way to rework and upgrade the ESA crew training, e.g. to condense the theoretical knowledge part of the training and focus more on hands-on training of crew relevant skills and emergency and safety relevant aspects.

This paper gives an overview of the process of ISS crew training development and implementation, and introduces the various training tools and facilities with focus on the ESA Columbus Systems training. The specific challenges of crew training will be presented and the lessons learned from 2 years of experience with Columbus operations in orbit and feedback from returned ISS crew members will be discussed. Finally, it is presented how this gained knowledge is used for the improvement and evolution of the Columbus Systems Training to Version 2.0.